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EXAMINER

YAM, STEPHEN K

ART UNIT

PAPER NUMBER

2878

DATE MAILED: 04/24/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/783,007

Applicant(s)

FUJINO, JUNJI

Examiner

Stephen Yam

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 2/15/01.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) _____ is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

(DETAILED ACTION)

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1 to 10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite ~~for failing to particularly point out and distinctly claim the subject matter which applicant~~ regards as the invention. The use of the term "not directly connected to the electric signal" referring to the second electrode is unclear, as Fig. 1D shows the electrode connected to a diode and to the differential amplifier. The inventor should rephrase the description regarding the second electrode.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 3, 4, and 9 are rejected under 35 U.S.C. 102(b) as being unpatentable by Sawada et al. US Patent No. 5,652,425. With regard to claims 1 and 9, Sawada teaches a photoelectric conversion and amplification device that converts an optical signal into an electric signal (on Column 1, lines 6-8 and the abstract). Sawada teaches the attachment of the photoelectric conversion circuit (Fig. 1) to the amplifier, as described in the outputs (Fig. 1, ref. 7 & 8) to the inputs of the amplifier (Fig. 3, ref. 7 & 8). Since electrodes are generally used to

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attach two separate circuits, it is assumed that electrodes are connected to the outputs of the two preamplifiers, at Fig. 1, ref. 4b & 6b to interconnect the two components of Sawada's invention. Sawada furthermore shows a first wire connecting the photoelectric output (Fig. 1, ref. 4b & 7) to the first input of the amplification circuit (Fig. 3, ref. 7) and a second wire connecting the dummy output (Fig. 1, ref. 6b & 8) to the second input of the amplification circuit (Fig. 3, ref. 8).

Regarding claim 2, Sawada teaches the use of identical bias voltages through a bias circuit

(Column 2, line 52- also Fig. 1, ref. 2) to supply a voltage of V_{PD} to both a light-receiving element and a capacitor with an equivalent capacitance to the light-receiving element, so bias voltages at both inputs of the differential amplifier are identical. Regarding claim 3, Sawada also shows in Fig. 1 & 3 that the first and second wires connecting the photoelectric circuit to the amplifier are parallel, and of approximately the same length- thus the distance between the first photoelectric output electrode (Fig. 1, ref. 4b) and the first input terminal (Fig. 3, V_{in1}) is substantially identical to the distance between the second photoelectric output electrode (Fig. 1, ref. 6b) and the second input terminal (Fig. 3, V_{in2}). By the two wires being parallel and the same length, it is also concluded that the distance between the first and second output electrodes is identical to the distance between the first and second input terminals, as in claim 4. Regarding claim 9, "an infrared communication device" cannot be given any patentable weight since the body of the claim does not claim such structure (see also, Sawada Column 1, lines 10-11).

Claims 1, 2, and 10 are rejected under 35 U.S.C. 102(b) as being unpatentable by Morita et al. US Patent No. 4,626,678. Regarding claim 1, Morita teaches the photoelectric conversion and amplification device that converts an optical signal into an electric signal (Column 1, lines

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46-54), and the attachment of a dummy photodiode (Column 2, line 59-60- also Fig. 3, ref. 1') to solely capture external noise. Regarding claim 2, Morita attaches both photodiodes to the same bias voltage V_b , as seen in Fig. 3. Regarding claim 10, Morita also teaches the attachment of resistors to the inputs of the amplifier (see Fig. 3, R_1). It is further seen that two wires connect the outputs/electrodes of the two photodiodes to the inputs of the differential amplifier (Fig. 3, ref. 4).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sawada et al. over Agarwal US Patent No. 6,175,438. Sawada teaches a photoelectric conversion circuit to transform light energy into an electrical signal (Column 1, line 54- also Fig. 1, ref. 1). Sawada also teaches the use of a capacitor (Fig. 1, ref. 5) to match the light-receiving element's electromagnetic (impedance) properties, as described in Column 1, line 60 to Column 2, line 3. Sawada does not teach the specific photodiode type, and does not use a dummy photodiode to recognize external noise. Agarwal teaches the use of a CMOS semiconductor, consisting of a N-type semiconductor and P-type semiconductor, in Column 1, line 46-50, for a photodiode chip for photoelectric purposes. It would have been obvious to one of ordinary skill in the art at the

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time the invention was made construct the invention from Sawada with CMOS technology taught by Agarwal, as CMOS is widely used and recognized as an effective transistor technology. Regarding claim 6, it also would have been obvious to one of ordinary skill in the art at the time the invention was made to use a dummy photodiode in the place of the capacitor in Sawada's invention, as using the dummy photodiode does not provide any further benefit over the capacitor due to the dummy photodiode's usage to match the impedance of the first

photodiode, which a capacitor sufficiently provides. The dummy photodiode's light-receiving properties are never used, so it is common knowledge that any element with similar impedance properties can be used to generate a signal-less output containing system-wide external noise.

Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sawada et al in view of Watanabe US Patent No. 5,132,532. Sawada teaches the mounting of his invention on a TO package in Column 1, lines 49-54, on a base (equivalent to a substrate). Sawada does not teach the specific construction using a first and second conductor pattern and a first and second wire. Watanabe teaches the connection between a photoelectric converter chip and an amplifier using a conductor pattern (Fig. 3, ref. 31) and a bonding wire (Fig. 3, ref. 22).

Regarding claim 7, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Sawada with the connection methods taught by Watanabe, to provide less risk of chip breakage. Regarding claim 8, it would have been obvious to one of ordinary skill in the art at the time the invention was made to connect the two wires as two separate bonding operations, as two separate electrical connections are being bonded, providing a lowered risk of chip breakage.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Agarwal et al. Agarwal teaches the use of two photodiodes (Fig. 3, ref. 301 & 302) with input into a differential amplifier to cancel external noise (Column 4, lines 30-35 - also Fig. 3). It is common knowledge that photodiodes are attached to a supply voltage to provide an output current upon incident light and that electrodes are used to attach a photoelectric circuit to an amplification device. It would also be assumed that two wires would be used to connect the two electrodes to the two input terminals of the differential amplifier. Agarwal does not mention the use of resistors between the amplifier input terminals and ground. It is obvious to one of ordinary skill in the art at the time the invention was made to add a resistor between the amplifier input terminals and ground, to induce a current flow for the amplifier, as such a configuration would improve the amplification process, and adding resistors prior to amplification is common knowledge to one with skill in the art.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Venkatachalam, US Patent No. 5,7624,967, teaches the use of two light-receiving elements with a differential amplifier to cancel noise.


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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen Yam whose telephone number is (703)306-3441. The examiner can normally be reached on Monday-Friday 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Seungsook Ham can be reached on (703)308-4090. The fax phone numbers for the organization where this application or proceeding is assigned are (703)308-7724 for regular communications and (703)308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

sky
April 18, 2002


SEUNGSOOK HAM
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